

## **Automatic Sanitizer and Deodorizer**

### **Field of the Invention**

The present invention is directed toward an automatic sanitizer, and in particular to a sanitizer deodorizer that sanitizes and deodorizes the air around a toilet, cat litter box, or a laundry hamper.

### **Background of the Invention**

Bathroom and cat litter odor are some of the most unwelcome odors that can permeate a house, with perhaps dirty laundry odor following closely behind. To combat these odors, there are a number of deodorizers on the market that purport to get rid of the odors. However, these deodorizers are only temporarily masking odors. To remove these odors, their sources need to be destroyed. A sanitizing agent such as ozone is capable of oxidizing these sources and acts as a sanitizer/deodorizer. Ozone is the second most potent sanitizer known. Ozone does not cover up odors with perfumes. Instead, it actually destroys the odors, viruses, mold, and bacteria at the molecular level. Existing methods of sanitizing include spraying sanitizer from a canister into the air, or onto the problem area.

U.S. Patent No. 5,896,591 discloses a toilet air freshener. The air treatment device for conditioning air within a conventional toilet bowl includes an air treatment assembly and an automatic flush mechanism. The air treatment assembly includes a cylindrical housing mounted to the rear of the toilet bowl rim with the toilet seat and lid swingably mounted thereto and an air duct having a free end extending into the toilet bowl proper. A seal underlying the toilet seat contacts the toilet bowl rim when the seat is in a horizontal position. Included

within the housing are fans which draw air through the duct and a carbon filter to treat the air drawn therethrough. A flush assembly includes a motorized arm having a free end attached to the conventional flapper found in the water tank of the toilet bowl. Upon powering the motor, the arm moves the linked flapper valve from its normal closure position which allows the water to escape from the tank and flush the toilet bowl. A pressure sensitive switch embedded in the toilet seat activates the fans of the air treatment assembly and arm of the flush assembly upon user pressure being exerted on or released from the seat. The switch may be designed so as to alternatively or sequentially activate the air treatment and flush assemblies. The air treatment and flush assemblies effectively treat the foul air associated with a conventional toilet.

U.S. Patent 5,454,122 discloses a toilet ventilation system. The toilet ventilation system which ventilates the air within the bowl of a water closet, deodorizes it, adds air freshener and returns it to the toilet bowl. The system may also serve as a room air freshener and/or a comfort heater for warming the air within the toilet bowl. The system may be equipped to run on AC, DC, or both. The system has four interconnecting modules: a) a ventilator module located beneath the toilet seat, b) a central module which contains the ductwork to connect all of the other modules and the control panel for operating all of the functions of the system, c) a main blower module which contains the centrifugal fan which recirculates the air and filters which deodorize and add fragrance to the air, and d) a heater module which contains an air heater and a centrifugal fan for warming the air beneath the toilet seat.

U.S. Patent 5,224,975 discloses a litter box deodorizer. The deodorizing device has a container body having an open end, a closed end and a cylindrical side wall defining a cavity therein. Chunks of zeolite are disposed within the cavity and retained within the container body by a sealing mechanism. The cylindrical side wall of the container body has a plurality of substantially uniform-sized apertures disposed thereon to permit exposure of the retained zeolite to the odors. A sealing mechanism may be permanently or releasably attached to the container body. A securing mechanism secures the deodorizing device to a structure within the malodorous environment. The zeolite after use can be recharged by exposing to fresh air, sunlight and heat and then reused. In addition to being used in a pet's litter box, the device can be used in many environments, including animal containment areas, living areas, production areas, food storage areas, work areas and automobiles.

U.S. Patent 4,472,841 discloses a bathroom air sanitizer and deodorizer designed to be used with a conventional toilet bowl. A housing means is used, and is so constructed as to have an air intake port at the top and an air exhaust port on the side. A toilet bowl rim clip is attached to the bottom of the air intake port, and an on and off pressure switch is attached to the top of the air intake port. A filtering device consisting of a disinfectant fluid container, a filter frame, and two filters, is placed within the housing means directly behind the air intake port. A filter rotation motor is mounted next to the filter device and is coupled by means of a belt to a pulley that is attached to the filter frame. An exhaust fan is mounted within the housing means at the air exhaust port. A combination battery

holder and leveler is attached to the bottom exterior of the housing means, and a filler tube is attached to the exterior of the housing means passing thru the lower end of the housing means and attached to the disinfectant fluid container. Air seals are used within the housing means to insure maximum air flow and to direct the contaminated air directly into the filter device.

There is a need, however, for an automated, sanitizer and deodorizer wherein the odors of a cat litter box, bathroom area, and laundry hamper will be easily destroyed, and that can operate automatically without intervention from a person.

### **Objects and Summary of the Invention**

It is an object of the present invention to provide an automated, sanitizer that may be placed in an area to be sanitized.

Another object of the present invention is to provide an automated sanitizer deodorizer wherein sanitizing and deodorizing agents such as ozone may be used in a desired quantity in order to sanitize and deodorize them.

Another object of the present invention is to provide a means for producing ozone (an ozone generator) for use in an automatic sanitizer and deodorizer.

Another object of the present invention is to provide a system having a rheostat electrically connected to the ozone generator for adjusting the output or concentration of ozone.

Another object of the present invention is to provide a programmable timer processor that coordinates programmed functions and monitors input from users

and or sensors for the purpose of controlling output and concentration of ozone and nightlight operation.

Another object of the present invention is to provide an automated, sanitizer having a fan, pressurized source or other means to circulate ozone.

Another object of the present invention is to provide a mechanical switch and/or a combination of sensors that detect a person or animal entering an area to be deodorized. For example a motion sensor, infrared light sensor, pressure sensor, ambient light sensor, moisture sensor, temperature sensor, mechanical switch or any combination of sensors or switches could be incorporated into the automated sanitizer. The sensor and/or switch then signals the programmable timer/processor to initiate or cease the flow of ozone.

Another object of the present invention is to provide an automated sanitizer in which an ozone sensor or detector may be incorporated as a safety measure. It would measure ambient air outside surrounding the automated sanitizer and signal the processor to adjust or cease production of ozone if ambient levels became too high.

Therefore, in accordance with a first aspect of the present invention, a novel automated sanitizer system is provided. This novel automated sanitizer includes a case having an exterior portion, an inner chamber, and at least one aperture, a sanitizer within the inner chamber of the case for release into the air through the at least one aperture, a generator disposed within the inner chamber of the case, for generating the sanitizer, and a fan, disposed within the case

proximate to the at least one aperture, for dispersing the sanitizer through the at least one aperture.

In accordance with another aspect of the present invention, a novel automated sanitizer is provided for sanitizing and deodorizing a toilet area, litter box, laundry hamper, and their surrounding areas. The novel automated sanitizer includes a hollow case, having an exterior portion and an inner chamber. The automated, sanitizer includes a supplementary pressurized source of sanitizer.

### **Brief Description of the Drawings**

The foregoing summary, as well as the following detailed description of a preferred embodiment of the present invention will be better understood when read with reference to the appended drawings, wherein:

FIGURE 1 is a side elevation in cross section of an automated sanitizer in accordance with the present invention.

FIGURE 2 is a schematic representation of the automated sanitizer of

FIGURE 1 shown disposed upon a toilet.

FIGURE 3 is a schematic representation of the automated sanitizer of

FIGURE 1 shown disposed upon a bathroom vanity proximate to the toilet.

FIGURE 4 is a schematic representation of the automated sanitizer of FIGURE 1 shown disposed upon a cat litter box.

FIGURES 5A-5C are representational views of a motion sensor in accordance with the present invention, shown in separate configurations.

FIGURE 6 is a schematic representation of the automated sanitizer of FIGURE 1 shown disposed upon a laundry bin.

### **Detailed Description of the Preferred Embodiment**

The invention comprises an automatic sanitizer and deodorizer that can be utilized for a number of applications within a home such as an association with a bathroom, bedroom, laundry room, trash can or litter box area. In one embodiment, the invention comprises a housing having an exterior and interior portion. A fan is situated within the case that would disperse ozone as a sanitizer/deodorizer through the housing. The system further incorporates an ozone generator. The unit also includes a quick start button used to manually start the unit for a predetermined period of time. A sensor may be included. A nightlight comes on for a predetermined period of time when motion is detected. In a broader embodiment, the housing is omitted and the invention comprises only the generator and sensor.

Referring now to the drawings, wherein like reference numerals refer to the same components across the several views, and in particular to FIGURE 1, there is shown an automated sanitizer 10. The automated sanitizer 10 includes a

case 11, which has an exterior portion 14 and an inner chamber 12. The case 11 also includes apertures 13 disposed about the exterior portion 14 of the case, and a fan 16, disposed within the inner chamber 12 of the case 11 proximate to the apertures 13. The fan 16 disperses a sanitizer within the inner chamber 12 of the case 11 to the outside air when activated.

A sanitizer generator 17 is disposed within the inner chamber 12 of the case 11 for generating ozone for introduction into the outside air through the apertures 13. Ozone is the second most potent sanitizer known to man and is a preferred sanitizer in the present invention. Ozone does not cover up odors with perfumes. It actually destroys the odors, viruses, bacteria, and mold at the molecular level. The ozone kills existing bacteria, viruses, mold and helps prevent odors and other problem growths. Additional sanitizing and deodorizing agents may be introduced into the air by means of an optional pressurized source. In the broadest embodiment, the invention can omit the case or housing.

A rheostat 18 is electrically connected to the generator 17 so as to allow for the adjustment of ozone output or concentration. A programmable timer/processor 19 could be incorporated to automatically operate the generator 17. A button 20 is disposed on the exterior portion 14 of the case 11, to allow for a sanitizing/deodorizing cycle to be started when the button 20 is depressed.

A motion sensor 21 is disposed on the exterior portion 14 of the case 11 in order to sense motion at or near the automated sanitizer 10. When the motion sensor 21 senses motion, it can be set to wait a predetermined period of time before activating the fan 16 and generator 17 in order to commence a sanitizing



cycle. The motion sensor 21 is pivotally mounted on the exterior portion 14 of the case 11, so as to allow the motion sensor 21 to pick up motion from a variety of directions. Referring now to FIGURES 5A, 5B, and 5C, various configurations of the motion sensor 21 can be seen. For example, in FIGURE 5A, the motion sensor is shown in a generally downward relation to the case 11. In this fashion, the motion sensor 21 will pick up motion, for example, when a toilet lid is lifted or placed down, or when someone sits down on the toilet. In FIGURE 5B, the motion sensor 21 is shown rotated about an axis 'A' such that the motion sensor 21 detects motion in a generally sideways orientation relative to the case 11. In this configuration, the motion sensor 21 would detect motion of a person or animal walking past the automated sanitizer 10. FIGURE 5C shows the motion sensor 21 rotated further about the axis 'A' such that the motion sensor 21 would detect motion generally in front of the automated sanitizer 10. Additionally, the motion sensor 21 could be mounted alternately such that the motion sensor can be pivoted to point in a variety of positions. For example, the motion sensor 21 could be mounted on a flexible tube, which is capable of being manipulated to point the motion sensor 21 in virtually any direction.

As shown in FIGURE 2, the unit of the present invention can be utilized in conjunction with a toilet 30, having a bowl 31, seat 32, and tank 33. The automated sanitizer 10 is shown mounted on the top of the tank 33. As shown, for example, when the toilet seat 32 is raised or when one sits on the toilet 30 creating motion, the system will come on for a predetermined period.

Alternately, referring to FIGURE 3, there is shown a bathroom vanity 40, which includes a base 41, and a top 42. In this configuration, the automated sanitizer 10 is placed on the top 42 of the vanity 40, such that when a person either walks past the case 11, or sits on the toilet 30, the motion sensor 21 will detect the motion and commence a sanitizing cycle.

The automated automatic air freshener and sanitizer can further be used as a litter box system. FIGURE 4 shows the automated sanitizer 10 disposed upon a top 52 of a litter box 50, which also has a bottom portion 51. The motion detector 21 detects when a cat enters the bottom portion 51 of the litter box 50, and activates the automated sanitizer 10.

Referring to FIGURES 5A, 5B and 5C, illustrate alternative embodiments of the invention show the adjustability of the motion sensor. As shown, the motion sensor can be adjusted to various directions depending upon the needs of more specific applications.

FIGURE 6 shows the disposition of the automated sanitizer 10 in relation to a laundry bin 60. The laundry bin 60 includes a basin 61 and a lid 62 that is hingeably attached to the basin 61 by virtue of hinge 63. As shown in FIGURE 6, the automated sanitizer 10 rests on the lid 62 of the laundry bin 60. The automated sanitizer 10 may be affixed to the lid 62 of the laundry bin 60 by any means known to one of ordinary skill in the art. However, in a preferred embodiment of the present invention, the automated sanitizer 10 is affixed to the lid 62 of the laundry bin 60 by means of a 'hook and loop' type fastener. One such fastener is known under the trade name of VELCRO®. The motion sensor

21 will detect motion from a user when he or she utilizes the laundry bin 60, and activate the automated sanitizer 10.

With reference now to FIGURE 1, a typical sanitizing/deodorizing cycle will now be described. The button 20 may be depressed in order to start the sanitizing/ deodorizing cycle. For example, the button 20, when depressed, may activate the timer 19. Once activated, the timer 19 will begin the sanitizing cycle by causing the generator 17 to begin producing ozone. In a preferred embodiment of the present invention, the generator 17 will produce ozone as the sanitizer/ deodorizer, however, it can be readily seen by one of ordinary skill in the art that any sanitizing or deodorizing agents may be employed. Before, or during, the cycle, the rheostat 18 may be adjusted in order to increase or decrease the amount or concentration of the sanitizer/deodorizer that is produced by the generator. Alternatively, the programmable timer/processor 19 may be programmed to turn the generator 17 on and off at various times without the interaction of a person aside from setting the program. In fact, the timer/processor 19 may be activated and deactivated by the motion sensor 21.

This ozone unit will automatically sanitize/deodorize a cats litter box 50 or toilet 30 and their surrounding areas after they have been used. The automated sanitizer unit uses ozone to sanitize and deodorize a cat litter box, toilet, laundry hamper, trash can, and their surrounding areas. This ozone unit may be incorporated into a cat litter box, laundry hamper, or trash can, or be used separately in their surrounding areas. This ozone unit may also be placed on or near a toilet, sensing when it is being used. The ozone generator unit may

consists of any combination of: a means for producing ozone, an internal fan, a motion detector or other means of detecting the presence of a cat or a person, a processor, a programmable timer, an ozone sensor, a rheostat, a solenoid valve, ambient light sensor, a nightlight, and a quick start button. The ozone generator unit can be powered by a battery or 110 volt source. Since ozone is not capable of existing for a long period of time, it must be generated as needed. There are several manufacturers that market ozone generators, such as JENESCO and E-TECHNOLOGIES.

The motion detector 21 senses a cat entering or leaving the litter box 50. After it senses the cat entering or leaving the litter box 50, it waits a predetermined period of time (possibly 30 seconds) and starts the ozone generator 17 circulating ozone in and or around the litter box 50. The ozone generator 17 runs for a predetermined period of time unless motion is sensed again interrupting this run period. After the motion stops, the unit will wait for another predetermined period and then run the ozone generator 17 for its predetermined period.

The ozone unit can be placed on or near a toilet 30. Its motion detector 30 will detect the toilet being used and run the ozone generator 17 for a predetermined period of time.

A quick start button 20 may be incorporated into the ozone unit. If the consumer wants to start the ozone generator manually they can push the quick start button 20 on the unit and it will run for a predetermined period of time. The quick start button 20 can be pushed again to manually terminate the flow of

ozone. A programmable timer 19 may be incorporated into the ozone unit and be programmed to run during scheduled periods of time during the day. A rheostat 18 may be incorporated into the unit for consumer to adjust output and or concentration of ozone.

An ozone detector may be incorporated as a safety measure. It would measure ambient air surrounding the ozone unit and adjust or cease production of ozone if ambient levels became too high.

Other sanitizing or deodorizing agents can be used in addition to ozone. These agents may come in the form of a solid, liquid saturated material, gel, or from a pressurized supplementary source (a pressure vessel or spray-can). A pressure vessel or spray-can may be incorporated into the ozone unit. The spray-can may be sprayed manually or automatically at timed intervals in and around the litter box, toilet area, trash can, and laundry hamper. A spray-can or pressure vessel may be connected to a special nozzle with an internal solenoid valve. This solenoid valve would be activated by the motion sensor 21 and/or programmed timer 19 to initiate or cease flow for predetermined periods of time. The sanitizing or deodorizing agents and the ozone may alternately flow at separate times so as not to mix with each other. The other forms of sanitizing or deodorizing agents may be placed in the flow path of the ozone and circulate with the ozone. The motion detector 21 and or an ambient light sensor may also turn on a night-light 22 for a predetermined period of time. This would illuminate inside and around the cat litter box 50, toilet 30, or hamper while they were in use.

In view of the foregoing disclosure, some of the advantages of the present invention can be seen. For instance, a novel automated sanitizer has been disclosed. The automated sanitizer can be used in a variety of locations, such as a bathroom, laundry room, trash can area, or litter box area, among many others. Additionally, the automated sanitizer is capable of automatic operation to sanitize/deodorize an area so that the area gets sanitized or deodorized without needing the intervention of a person.

It is to be noted that the present invention has been described in the context of a system contained within a case or housing. The present invention can be practiced without a housing or casing and need comprise only a sanitizer generator and sensor.

While the preferred embodiments of the present invention have been described and illustrated, modifications may be made by one of ordinary skill in the art without departing from the scope and spirit of the invention as defined in the appended claims.